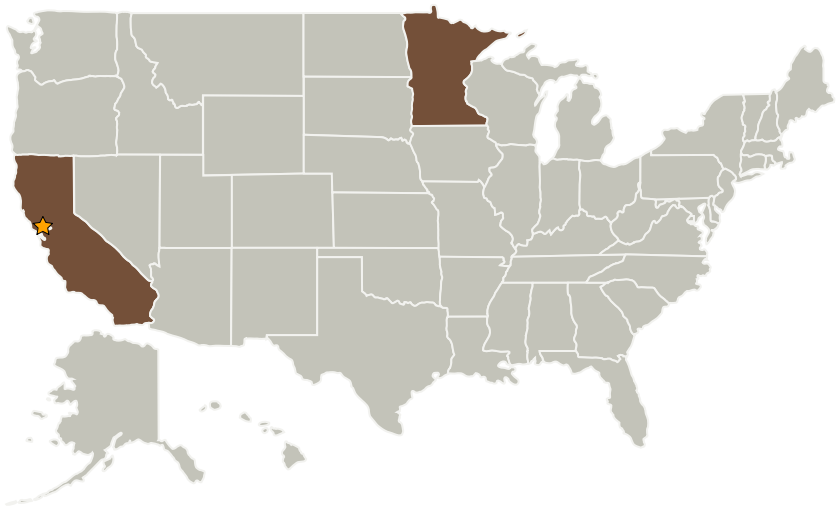
# System-Level Autonomy Trust Enabler (SLATE), Phase I

Completed Technology Project (2007 - 2007)

## Project Introduction

This SBIR project will achieve trusted, reconfigurable, intelligent autonomy through system-level validation. The goal is to design and develop a representation and reasoning system for system-level verification and validation (V&V) of high-level autonomous control for complex systems operating in dynamic environments. Starting from component-level behavioral guarantees, the System-Level Autonomy Trust Enabler (SLATE) will reason about composition, abstraction, and embedding of system components, resulting in high-confidence guarantees of behavior for high-level autonomous control systems relevant to a wide range of NASA applications, including manned and unmanned spacecraft, rovers, and habitats. SLATE will support incremental computation of guarantees and the assumptions required, vastly simplifying the reconfiguration, upgrading, or retargeting of autonomous control systems. Phase I will provide a feasibility demonstration and evaluation of SLATE's representation and inference through application to a multi-level robotic control system, and identify the key features needed in an application-ready version of SLATE. Phase II will develop an application-specific version and provide a user interface, address performance and reasoning issues, and demonstrate operation on a representative NASA application.

## Primary U.S. Work Locations and Key Partners

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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Ames Research Center (ARC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

**Small Business Innovation Research/Small Business Tech Transfer**

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| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| ★Ames Research Center(ARC) | Lead Organization | NASA Center | Moffett Field, California |
| Adventium Enterprises, LLC | Supporting Organization | Industry | Minneapolis, Minnesota |

| Primary U.S. Work Locations | |
|---|---|
| California | Minnesota |

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

## Technology Areas

**Primary:**

- TX15 Flight Vehicle Systems
  - TX15.2 Flight Mechanics
    - TX15.2.2 Flight Performance and Analysis